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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/725,401

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Akihiro Yoshida

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EXAMINER

CHEN, CHIA WEI A

ART UNIT

PAPER NUMBER

2622

NOTIFICATION DATE

DELIVERY MODE

07/30/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/725,401	Applicant(s) YOSHIDA, AKIHIRO	
	Examiner CHIA-WEI A. CHEN	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to the amendment dated 4/28/2008 in application 10/725401.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morimoto (US 6,453,124) in view of Serizawa et al. (US 6,593,970 B1).

As to claim 1, Morimoto teaches, in figure 1, a digital camera comprising:

- a range finding sensor to measure a distance to an object (distance-measuring sensor 15);
- an imaging device configured to receive an image of the object (image sensor 8);
- a focus lens configured to image the image of the object on the imaging device (taking lens 4);

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- a first focusing system of obtaining a focusing position by sampling a contrast of an object image formed on a light receiving surface with moving a focus lens along an optical axis (contrast AF method; col. 15, lines 22-31);
- a second focusing system of obtaining the focusing position by measuring a distance to an object based on a triangular surveying system (phase difference AF; col. 5, lines 27-36);
- a selection device configured to select that one of the first focusing system and the second focusing system is operative or that both of the first and second focusing systems are operative together (menu setting AF selection, state S12; flowchart Fig. 7),
- wherein the first focusing system is configured to detect the focusing position by means of the imaging device (image capture or three successive frames are done by the image sensor 8; col. 13, lines 41-46),
- wherein the second focusing system is configured to detect the focusing position by means of the range finding sensor (col. 5, lines 22-31);

but does not teach:

- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit having a first level conversion characteristic in which a predetermined gain setting value is set and a second level conversion characteristic

in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set,

- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Serizawa et al. teaches:

- an edge enhancement processing device (1100) configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit (edge enhancement amount control circuit 1160) having a first level conversion characteristic (coefficient of "1") in which a predetermined gain setting value is set and a second level conversion characteristic (coefficient of "2") in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set (col. 11, lines 3-17), and
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and

sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized. (Depending on a preset exposure interval, an edge enhancement amount control signal indicates a coefficient of "1" or a coefficient of "2" to the edge enhancement multiplier; see col. 11, lines 12-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the edge enhancement processing device of Serizawa et al. with the hybrid-focus digital camera of Morimoto to expand the dynamic range of a video signal for different image capture scenarios. Serizawa teaches the adaptation of an edge enhancement process during different conditions of photography. It would have been obvious to a person having ordinary skill in the art to have used the edge enhancement parameters with the appropriate photographing conditions to improve the dynamic range of the captured image. (See col. 1, lines 32-35 of Serizawa et al.)

As to claim 2, Morimoto teaches, in figure 1, a digital camera comprising:

- a range finding sensor to measure a distance to an object (distance-measuring sensor 15);
- an imaging device configured to receive an image of the object (image sensor 8);
- a focus lens configured to image the image of the object on the imaging device (taking lens 4);

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- a first focusing system of obtaining a focusing position by sampling a contrast of an object image formed on a light receiving surface with moving a focus lens along an optical axis (contrast AF method; col. 15, lines 22-31);
- a second focusing system of obtaining the focusing position by measuring a distance to an object based on a triangular surveying system (phase difference AF; col. 5, lines 27-36);
- a selection device configured to select that one of the first focusing system and the second focusing system is operative or that both of the first and second focusing systems are operative together (menu setting AF selection, state S12; flowchart Fig. 7),
- wherein the first focusing system is configured to detect the focusing position by means of the imaging device (image capture or three successive frames are done by the image sensor 8; col. 13, lines 41-46),
- wherein the second focusing system is configured to detect the focusing position by means of the range finding sensor (col. 5, lines 22-31);

but does not teach:

- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object,
- a system control unit having a first level conversion characteristic in which a predetermined limit setting value is set and a second level conversion characteristic

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in which a limit setting value larger than the limit setting value of the first level conversion characteristic is set,

- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Serizawa et al. teaches

- an edge enhancement processing device (1100) configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit (edge enhancement amount control circuit 1160) having a first level conversion characteristic (coefficient of "1") in which a predetermined gain setting value is set and a second level conversion characteristic (coefficient of "2") in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set (col. 11, lines 3-17), and
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and

sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized. (Depending on a preset exposure interval, an edge enhancement amount control signal indicates a coefficient of "1" or a coefficient of "2" to the edge enhancement multiplier; see col. 11, lines 12-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the edge enhancement processing device of Serizawa et al. with the hybrid-focus digital camera of Morimoto to expand the dynamic range of a video signal for different image capture scenarios. Serizawa teaches the adaptation of an edge enhancement process during different conditions of photography. It would have been obvious to a person having ordinary skill in the art to have used the edge enhancement parameters with the appropriate photographing conditions to improve the dynamic range of the captured image. Although the Serizawa reference does not expressly teach a limit setting value to improve the edge enhancement processing, a person having ordinary skill in the art would have known to adjust the gain and limit setting parameters to improve and manipulate edge enhancement processing to obtain desired results. (See col. 1, lines 32-35 of Serizawa et al.)

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morimoto (US 6,453,124) in view of Malkin et al. (US 6,614,474 B1).

As to claim 3, Morimoto teaches, in figure 1, a digital camera comprising:

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- a range finding sensor to measure a distance to an object (distance-measuring sensor 15);
- an imaging device configured to receive an image of the object (image sensor 8);
- a focus lens configured to image the image of the object on the imaging device (taking lens 4);
- a first focusing system of obtaining a focusing position by sampling a contrast of an object image formed on a light receiving surface with moving a focus lens along an optical axis (contrast AF method; col. 15, lines 22-31);
- a second focusing system of obtaining the focusing position by measuring a distance to an object based on a triangular surveying system (phase difference AF; col. 5, lines 27-36);
- a selection device configured to select that one of the first focusing system and the second focusing system is operative or that both of the first and second focusing systems are operative together (menu setting AF selection, state S12; flowchart Fig. 7),
- wherein the first focusing system is configured to detect the focusing position by means of the imaging device (image capture or three successive frames are done by the image sensor 8; col. 13, lines 41-46),
- wherein the second focusing system is configured to detect the focusing position by means of the range finding sensor (col. 5, lines 22-31);

but does not teach:

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- an edge enhancement processing device including a digital filter configured to enhance an edge component of an image signal of a photographed image obtained by photographing said object; and
- a system control unit having a first level conversion characteristic in which a setting value of a digital filter is set and a second level conversion characteristic in which a setting value of the digital filter having a characteristic which enhances a high frequency component than the setting value of the digital filter of the first level conversation characteristic is set, and
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Malkin et al. teaches

- an edge enhancement processing device (300) including a digital filter configured to enhance an edge component of an image signal of a photographed image obtained by photographing said object; and
- a system control unit (HLUT 210h) having a first level conversion characteristic in which a setting value of a digital filter is set and a second level conversion characteristic in which a setting value of the digital filter having a characteristic which

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enhances a high frequency component than the setting value of the digital filter of the first level conversion characteristic is set (a lookup table containing a plurality of coefficients for digital filters; col. 5, lines 15-19), and

- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized. (Coefficients of the digital filter are adjusted according to the mode of the camera, i.e., zoom ratio, and at high zoom ratios, the filter coefficients have a sleeper slope than at a low zoom ratio. See col. 4, line 66-col. 5, line 14.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the digital filter edge enhancement processing device of Malkin with the hybrid-focus digital camera of Morimoto to provide an adaptive edge sharpening apparatus and method which sharpens an image without significantly amplifying noise. Malkin teaches the adaptation of an edge enhancement process during different conditions of photography. It would have been obvious to a person having ordinary skill in the art to have used the edge enhancement digital filter parameters with the appropriate photographing conditions (including autofocusing

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conditions) to improve the edge enhancement while maintaining an image with low noise. (See col. 2, lines 4-6 of Malkin et al.)

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIA-WEI A. CHEN whose telephone number is (571)270-1707. The examiner can normally be reached on Monday - Friday, 7:30 - 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chia-Wei A Chen/
Examiner, Art Unit 2622
07/21/2008

***/Ngoc-Yen T. VU/
Supervisory Patent Examiner, Art Unit 2622***